

WHAT IS CLAIMED IS:

- 1           1.       A polarizing device useful for polarizing a piezoelectric material  
2       having two surfaces in high-temperature gas, the polarizing device comprising:  
3               temperature-raising portion for raising the temperature of the  
4       piezoelectric material to a temperature required to polarize the piezoelectric  
5       material; and  
6               a constant-temperature bath having an atmosphere of gas that is kept at  
7       the required temperature, the constant-temperature bath incorporating a polarizing  
8       portion for polarizing the piezoelectric material while the temperature of the  
9       piezoelectric material is kept at the required temperature.
- 1           2.       A polarizing device according to Claim 1, wherein the constant-  
2       temperature bath further comprises an aging portion for performing an aging  
3       operation on the piezoelectric material that has been polarized by the polarizing  
4       portion.
- 1           3.       A polarizing device according to Claim 1, wherein the  
2       temperature-raising portion is configured and arranged to heat both surfaces of the  
3       piezoelectric material.
- 1           4.       A polarizing device according to Claim 3, wherein the  
2       temperature-raising portion includes radiating heating means for heating one of the  
3       surfaces of the piezoelectric material by radiation of heat.
- 1           5.       A polarizing device according to Claim 3, wherein the  
2       temperature-raising portion includes means for directly heating one of the surfaces  
3       of the piezoelectric material.

10000327-120401

1           6.     A polarizing device according to Claim 1, further comprising:  
2                 a transport mechanism for transporting the piezoelectric material from  
3     the temperature-raising portion to the constant-temperature bath; and  
4                 a control portion that controls transportation of the transport mechanism.

1           7.     A polarizing device according to Claim 6,  
2                 wherein the control portion controls a time selected from the group  
3     consisting of:  
4                     time for raising the temperature of the piezoelectric material by  
5     the temperature-raising portion;  
6                     time for setting the temperature of the piezoelectric material at a  
7     constant temperature inside the constant-temperature bath;  
8                     time for polarizing the piezoelectric material by the polarizing  
9     portion; and  
10                    time for performing an aging operation, wherein the constant-  
11     temperature bath further comprises an aging portion for performing an aging  
12     operation on the piezoelectric material that has been polarized by the polarizing  
13     portion; and  
14                    combinations thereof;  
15                 wherein the control portion controls in order to control the transportation  
16     of the transport mechanism based on the above time controlling operations.

1           8.     A polarizing device according to Claim 7, wherein the control  
2     portion controls the time of each operation so as to be substantially the same.

1           9.     A polarizing device according to Claim 6, further comprising a  
2     transport jig for receiving the piezoelectric material, the transport mechanism  
3     transporting the transport jig.

10000337-120401

1 10. A polarizing device according to Claim 9,  
2 wherein the transport jig comprises a pallet including a bottom  
3 wall, a piezoelectric material holdable recess, and a through hole in the bottom  
4 wall; and  
5 the temperature-raising portion further comprising means for  
6 direct heating including a hot plate, the hot plate including heat transmitting  
7 protrusion and a heat transmitting contact surface, the heat transmitting protrusion  
8 being configured and arranged to be insertable into the through hole of the pallet  
9 and to be contactable through the through hole with a bottom surface of the  
10 piezoelectric material when accommodated in the recess, and the heat transmitting  
11 contact surface being contactable with a bottom surface of the pallet.

1 11. A method of polarizing a piezoelectric material inside high-  
2 temperature gas, the method comprising the steps of:  
3 raising the temperature of the piezoelectric material to a temperature  
4 required to polarize the piezoelectric material; and  
5 polarizing the piezoelectric material by placing the piezoelectric material  
6 into an atmosphere of gas the temperature of which is maintained at the required  
7 temperature.

1 12. A method of polarizing a piezoelectric material inside high-  
2 temperature gas according to Claim 11, further comprising the step:  
3 of performing an aging operation on the polarized piezoelectric material  
4 in the same atmosphere of gas.

1 13. A polarizing device according to Claim 1, further comprising:  
2 a piezoelectric material in the polarizing device.

1000327 120401

3

- 1           14.    A polarizing device according to Claim 5, wherein the means for
- 2    direct heating comprises a hot plate, the hot plate including heat transmitting
- 3    protrusions and a heat transmitting contact surface.

1000327-120401